Human Health & Disease

Date ___/___/___
Page _____

* Grood humor hypothesis
  ↳ fluid

- Given by Hippocrate (early Greek thinker)
- Supported by Indian Ayurveda System

- A/c to this theory :-
  balance fluid in body → healthy
  unbalance fluid in body → disease

- Fluid present in body :- blood, cough (plegmn), yellow bile ↳ by liver and blackbile (by spleen & kidney)

e.g. person with more blackbile belong to hot personality and have fever

- This hypothesis disproved by William Harvey He discovered blood circulatory system

- He disproved this hypothesis by following experiment :-

person with more blackbile in body

↓

Normal body temperature

Date / /
Page

* Health

- Health does not mean physical fitness or absence of disease.

- Health means Complete well-being in physical, mental and social aspects. (WHO)

- Health :-
  - → increase efficiency, productivity and economic prosperity
  - → decrease IMR and MMR, increase longevity

- Health is affected by following factor

(i) Genetic disorder / congenital disease
→ inherited disorder, present from birth
e.g. sickle cell anemia, Down syndrome

(ii) Lifestyle
→ eating habit, yoga, exercise, stress, personal hygiene, water intake, alcohol/drugs and sleep cycle

→ involves habits that you have or lack in your dailylife.

Date ___/___/___
Page _____

(iii) Infection
→ infection cause by pathogen during life time
→ also known as acquired disease (acquire - during lifetime)

Q. How to be healthy ?
→ Healthy balanced diet
→ Good intake of water
→ Hygiene source of food & water
→ proper disposal of waste
→ personal hygiene
→ Vaccination
→ Awareness about disease
→ proper sleep cycle
→ Exercise/yoga
→ No alcohol and drug abuse

* Disease
dis ease
(un) (comfortable)

· When one or more organs or organs system do not function effectively.

Disease

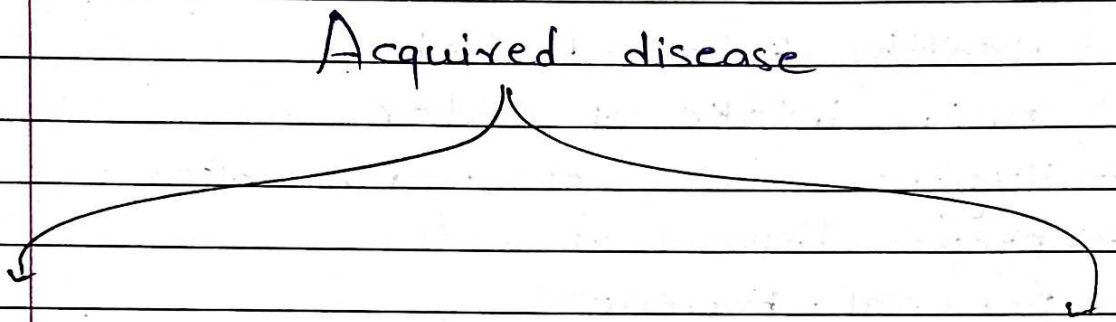
Congenital | Acquired

• Contagious disease
↳ spreads through physical contact

Date ___/___/___
Page ___

• Congenital disease
→ present from birth

• Acquired disease
→ Acquire during life time



Communicable or infectious disease
→ Can be tranfered easily from one person to another

Non-communicable or non-infectious disease
→ Can't be transmitted from one person to another

Note:- AIDS → fatal infectious disease
Cancer → fatal non-infectious disease

* Pathogen

• Disease causing organism

• Can be virus, bacteria, fungi, helminthes and protozan

Date ___/___/___
Page _____

To cause disease, pathogen must survive & grow/multiply in host body

- e.g. Bacteria affecting stomach
  ↳ must survive in low pH & resist - ~~en~~ enzymatic activities

* Typhoid

→ Bacterial pathogen ÷ Salmonella typhi
→ Affect small intestine
→ Circulate to other organs through blood
→ Enters in body through contaminated food and water
→ Symptoms ÷ Stomachache, constipation, weakness, loss of apetite, headache and sustain high fever (39°c – 40°c)
→ Detected through Widal test

- Classic case ÷ Mary Mallon
→ Nickname ÷ Typhoid Mary
→ Cook by profession
→ Asymptomic carrier of typhoid
→ Spread typhoid for many years through food she prepared.

- In severe case ÷ intestinal perforation & dead

Date ___/___/___
Page _____

* Pneumonia

→ Cause by bacteria Streptococcus pneumoniae or Haemophilus influenza

→ Affects lungs (alveoli)

→ Due to infection, alveoli become fluid-filled (efficiency of gaseous exchange ↓)

→ Symptoms ÷ cough, chills, headache & fever

→ Severe case ÷ lips, finger nails turn bluish-grey (due to lack of oxygen)

· Mode of transmission ÷ by air droplet, sharing of objects

* Other bacterial disease

(i) Dysentry

→ pathogen ÷ Shigella sonnie, Shigella flexneri & Shigella dysentriae

→ Affects intestine

(ii) plague (Black death)

→ pathogen ÷ Yersinia pestis

→ Affect blood & lymph

Date ___/___/___
Page _____

(iii) Diptheria
→ pathogen ÷ Corynebacterium diphtheria
→ Affect throat, tonsil, nose
→ diagnosis ÷ Schick test

(iv) Tetanus (lock jaw disease)
→ pathogen ÷ Clostridium tetani
→ Affect muscle of neck and jaw

* Common cold

→ Cause by group of virus ÷ Rhino virus
→ Affects respiratory pathway and nose (not lungs)
• Symptoms ÷ headache, nasal congestion, nasal discharge, weakness, sore throat, cough
→ lasts for 3-7 days
→ mode of transmission ÷ by air droplets, by sharing objects

* Other viral disease

(i) polio
→ polio virus (pathogen) (ss RNA)
→ Affects nerves

(ii) Dengue
→ pathogen ÷ dengue virus (arbo virus)
→ Affects liver

Date ___/___/___
Page _____

(iii) Chickangunia

→ pathogen ÷ chickangunia virus (toga virus)

→ Affects joints

* Ring worm

→ Caused by fungi genera ÷ microsporum, trichophyton, epidermophyton

→ Symptoms ÷ dry, scaly leison (with intense - itching)

→ Heat and humidity provide good environment for growth of fungi

→ Transmit through soil and by using towels, clothes, comb of infected person.

→ Commonly known as Athelete's foot

* Malaria

→ Caused by protozoa plasmodium

· four species of plasmodium that cause malaria ÷ plasmodium vivax, plasmodium malariae, plasmodium falciparum (fatal) and plasmodium ovale (rare)

Date ___/___/___
Page _____

→ Vector of plasmodium ÷ female anopheles mosquito

→ plasmodium needs 2 host (digenetic) to complete its lifecycle ÷ Human & ♀ anopheles mosquito

→ Symptoms ÷ chills and high fever (every 3-4 days)

• Life cycle of plasmodium •

infected ♀ anopheles mosquito bite a healthy person

↓

Sporozoite enters in body of person and affect live cell

↓

Sporozoite mutiple asexually in hepatocytes and burst them

↓

Sporozoite enters in RBC of infected person

↓

In RBC ÷ • sporozoite multiply asexually
• Convert haemoglobin into haemzoin
• form gametocyte
• Raupture RBC and release gametocyte and haemzoin

Date ___/___/___
Page ___

↓

female anopheles mosquito bite infected person and take blood (includes gametocyte)

↓

Gametocyte enters into gut of mosquito & fertilise

↓

fertilisation and development take place

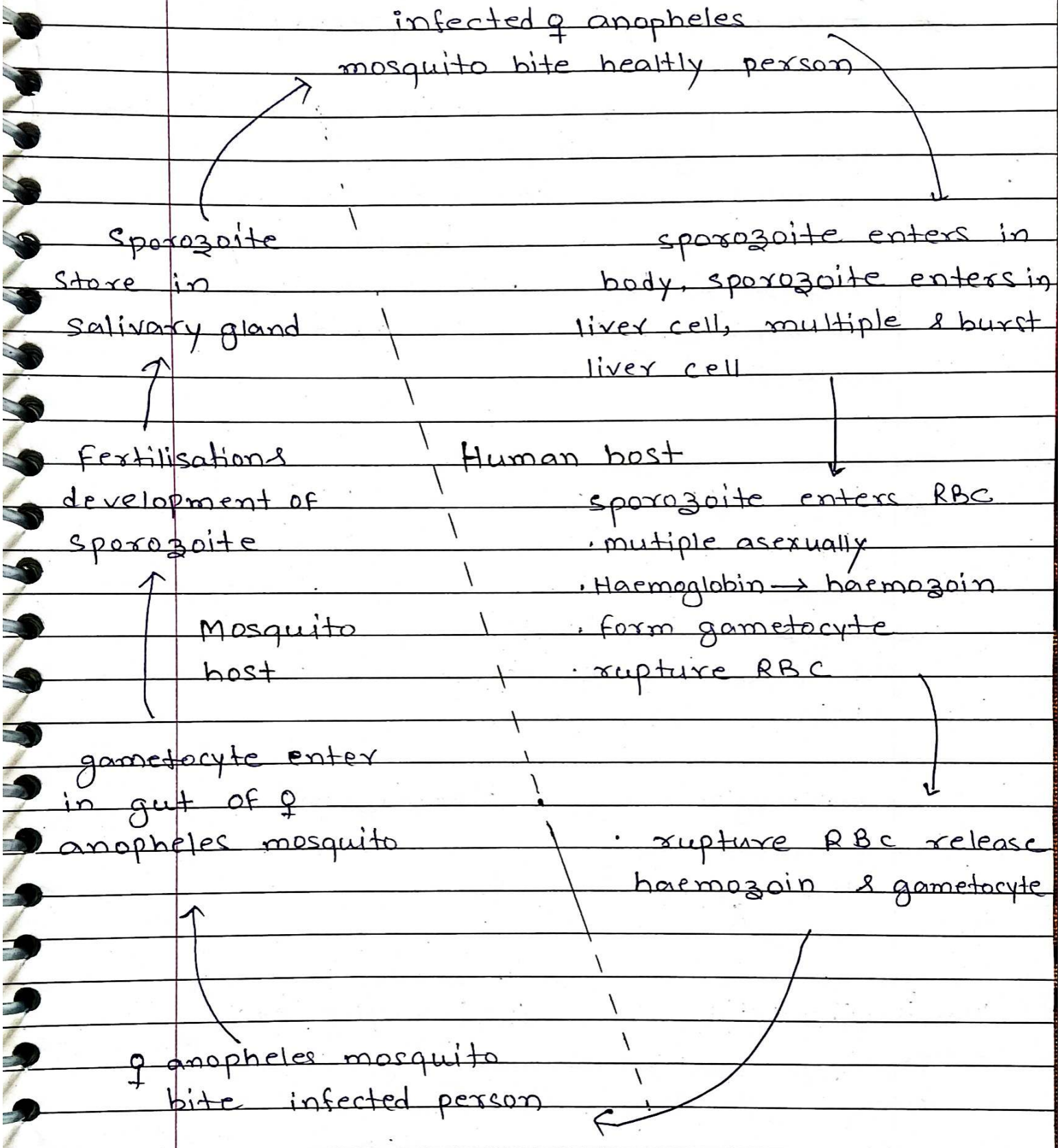
↓

Sporozoite form, escape to salivary gland and get store there.

↓

When this infected ♀ anopheles mosquito bite ~~unef~~ unaffected man, sporozoite enter in body and cycle continues.

Date ____/____/____
Page _____


infected ♀ anopheles mosquito bite healtly person
sporozoite enters in body, sporozoite enters in liver cell, multiple & burst liver cell
Human host
sporozoite enters RBC
· mutiple asexually
· Haemoglobin → haemozoin
· form gametocyte
· rupture RBC
· rupture RBC release haemozoin & gametocyte
♀ anopheles mosquito bite infected person
gametocyte enter in gut of ♀ anopheles mosquito
Mosquito host
Fertilisation & development of sporozoite
Sporozoite Store in salivary gland

Date ___/___/___
Page _____

* Amoebiasis (Amoebic dysentry)

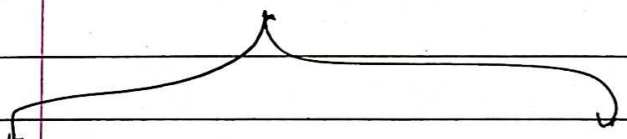
→ Due to protozoa Entamoeba histolytica
→ Affect large intestine
→ Spread through contaminated food and water
→ Mechanical carrier = ~~bes~~ house fly
→ Symptoms :- Abdominal pain, cramps, constipation, stool with excess mucous & blood cloat

* Extra points related to Plasmodium

→ In liver cell, sporozoite form Merozoite
→ Merozoite infects RBC
→ Trophozoite stage is formed in RBC which feeds on Haemoglobin

Haemoglobin ⟶ Haemozoin

→ In human



Exo-erythrocytic cycle

In liver

Erythrocytic cycle

In RBC

Date ___/___/___
Page _____

→ Sexual stage initiated in human and complete in gut of mosquito (♀ anopheles)

· After fertilization of gametocytes in gut of mosquito :-

zygote → ookinete → oocyst → release sporozoite
(burst)

→ Sporozoite store in salivary gland

* Helminthic disease

→ Disease cause by worms

(i) Ascariasis

→ Caused by Ascarias (common round worm)
→ Affect intestine
→ Transmitted through contaminated food and water (with eggs of parasite)
· Symptoms :- Muscular pain, internal bleeding Anemia, Intestinal blockage and fever.

(ii) Filariasis / Elephantiasis

→ Caused by filarial worm :- Wuchereria bancrofti & Wuchereria malayi
→ Affect lymphatic vessels of lower limb (mostly)
→ Slowly develop chronic inflammation in the residing organ

→ Also affect structure of genital organ (gross deformities)

Date __/__/__
Page _____

Male ÷ Scrotum
female ÷ breast

→ Transmitted by bitting of ♀ culex mosquito

* Preventive Measures against infectious disease

(i) Personal hygiene
→ clean your body properly
→ eat and drink clean water & food

(ii) Public hygiene
→ proper disposal of waste and excreta
→ Clean pools, tanks etc

(iii) For air-borne disease
→ use mask
→ maintain distance from infected person
→ Avoid sharing of object

(iv) for mosquito (insect) borne disease
→ use mosquito net
→ use mesh wire in window and door
→ Avoid stagnation of water
→ insecticide
→ introduce gambusia fish in pond.

Date ___/___/___
Page _____

(mosquito) Vector	disease
Anopheles	Malaria
Culex	filariasis
Aedes	dengue and chickungunya

* Immunity

. Ability of host to fight with the disease causing organism (pathogen), is known as Immunity

. Immunity is given by Immune system

Immunity

① Innate or congenital immunity

② Acquired immunity

① Innate immunity
→ present from birth
→ It is non-specific because it treat all pathogen similary
→ Has no memory
→ prevent entry & growth of pathogen

Date __/__/____
Page _____

② Acquired or Adaptive immunity

→ gain during the life time
→ Highly 'Specific' (treat every pathogen ~~specially~~ specifically)
→ Can differentiate b/w self and non-self cell (Discrimination)
→ Has memory

* Innate immunity

↳ It is study under 4 barriers ÷

(i) physical or anatomical barrier
→ prevent entry ~~in~~ of pathogen in body
→ Includes skin and mucus coating/lining.

(ii) physiological barrier
→ provide environment which kill bacteria
→ Include secretions like HCl in stomach (Acid: Anti-bacterial), Tear, caliva etc

(iii) Cellular barrier
→ Include phagocytic cells like ÷
- neutrophils [PMNL] ÷ polymorpho nuclear lymphocyte
- Natural Killer cells
- Monocyte
- Macrophage

Date ___/___/___
Page ___

Note :- (a) Neutrophil, monocyte and macrophage all phagocytic cell.

(b) Neutrophil, monocyte and monocyte found in blood. Macrophage is found in tissue.

(iv) Cytokine

→ Virally infected cell secretes substance called Interferous (proteinecious) that protects non-infected cell from viral infection

Note :- physical + physiological ⟶ 1st line of defense
Cellular + cytokine ⟶ 2nd line of defense

* Acquired Immunity

- 1° immune response :- When the body encounters the pathogen for the 1st time, the response is slower & takes time, but memory is developed (low intensity)

- 2° immune response :- When the same pathogen enters in our body next time, due to the memory of previous encounter, this time the response is much faster (High intensity)

- 2° immune response = Anemnestic response

Date ___/___/___
Page _____

Acquired immunity

Humoral immunity — cell-mediated immunity

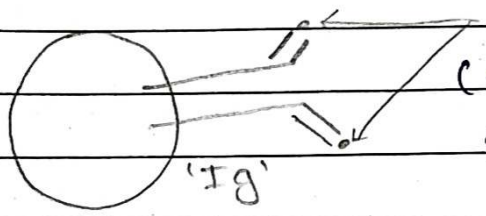
- Humoral immunity
→ B-cell / B-lymphocyte involved
→ Secretes antibody / immunoglobulins in blood
→ B-cell
  ↳ plasma B-cell
  ↳ Memory B-cell

- Cell-mediated immunity
→ T-cell / T-lymphocytes involved
→ T-cells
  ↳ T_H (Helper T-cell)
  ↳ Tc (cytotoxic T-cell / killer T-cell)
  ↳ Ts (suppressor T-cell)
  ↳ Memory T-cell

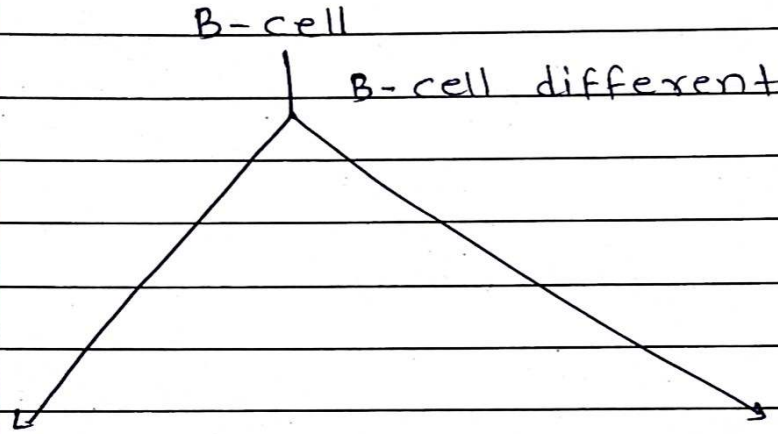
* Humoral immunity

- Antigen ÷ Antibody generating substance
(i) Whole organism (pathogen) can be antigenic
(ii) protein express on its surface could be antigenic
(iii) Toxins secreted by them could be antigenic.

Date ___/___/___
Page ___



(exposure of antigen 'Ag' for the first time)



(i) plasma B-cell
or, Effector B-cell
→ Secrete antibody ('Ig') during 1° immune response

(ii) Memory B-cell
→ store for future, for 2° immune response

- Immunoglobulins (Ig) / Antibody (Ab)

→ proteinaceous (glycoprotein) structure
→ 'Ab' represent as : H_2L_2

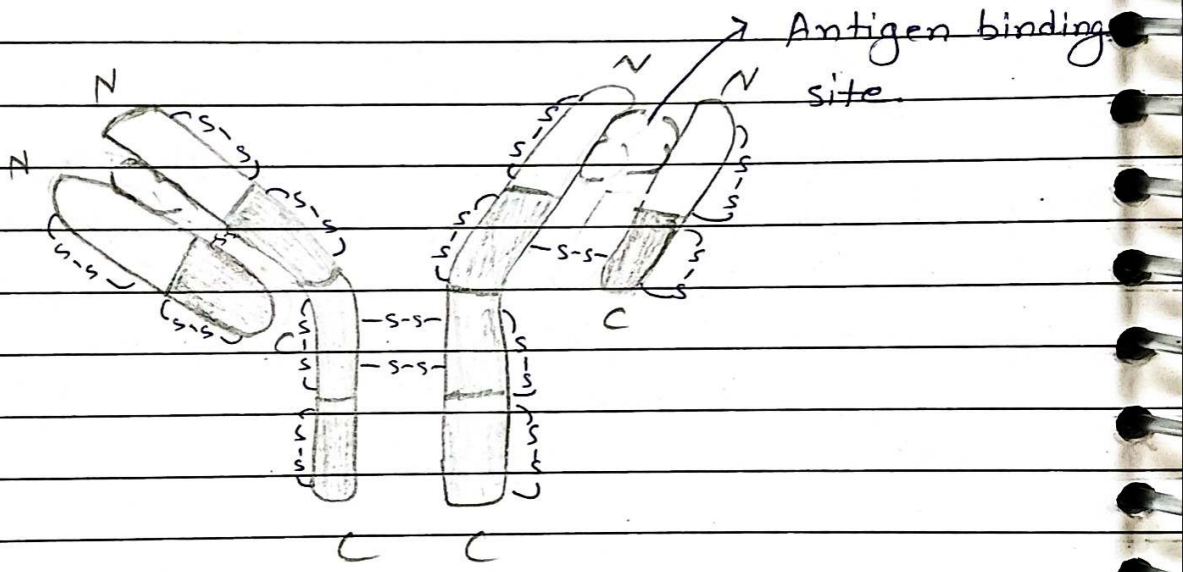
Date ___/___/___
Page ___

H_2L_2

2 heavy chain
→ Mol. weight 50KDal/each

2 light chain
→ Mol. weight 25 KDal /each

- Structure of antibody



- paratope/antigen binding site
→ Toward N-terminal
→ formed by both heavy & light chain
→ Chains are held together by disulphide
→ Total no. of disulphide bond = 16

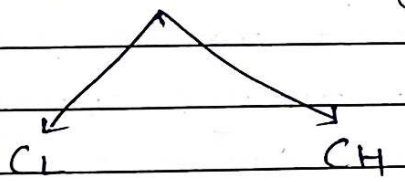
- White region is variable region

V_L V_H

↳ variable region of light-chain

Date ___/___/___
Page ___

- Black region is constant region



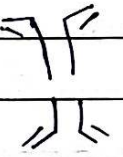
↳ const region of light chain

Note:- Epitope :- Antibody binding site on antigen

* Types of Ig/antibody

(1) IgA

→ 10-15%, Dimer, 4 paratope



→ present in secretion like colostrum, mucus, saliva etc

(2) IgM

→ 7-10%, pentamer, 10 paratope, heaviest antibody

(3) IgG

→ In maxm amount (75-80%), monomer, two paratope

→ Only Ig_G that cross placenta barrier to provide immunity to foetus.

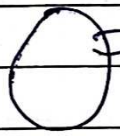
Date ___/___/___
Page ___

(4) IgE
→ In least amount, monomer, 2 paratope
→ ↑ in allergic response

(5) IgD
→ less than 1%, monomer, two paratope

* Cell-mediated immunity
→ Mediated by T-cells

(i) T_H
→ Secretes substance which help in B-cell differentiation and also help the Tc cell to kill pathogen
→ Also known as CD-4 cell



Tc-cell

(ii) Tc
→ Killer T-cell can directly kill the pathogen
→ Also known as CD-8 cell

(iii) ~~Memom~~ Memory T cell
→ store for future response

Date ___/___/___
Page _____

(iv) Ts

→ Suppresses TH & Tc cell for regulated activity time to time and prevent attack on self-cell

* Graft Rejection
  ↳ organ

- for organ transplantation blood group & tissue matching is neccessory
- Cells of our body has certain 'glycoproteins' on its surface called MHC (major histo-compatibility complex)
- Tissue matching = MHC matching
- person with maxm matching is selected as donor
- If 'MHC' mismatching is there the cell mediated immunity is responsible for Graft rejection.

Note: Immunosuppressents like Cyclosporin (obtain from a fugus), Cortisol are often given during transplantation & also life long to prevent unwanted immune ~~responses~~ responses.

Date ___/___/___
Page _____

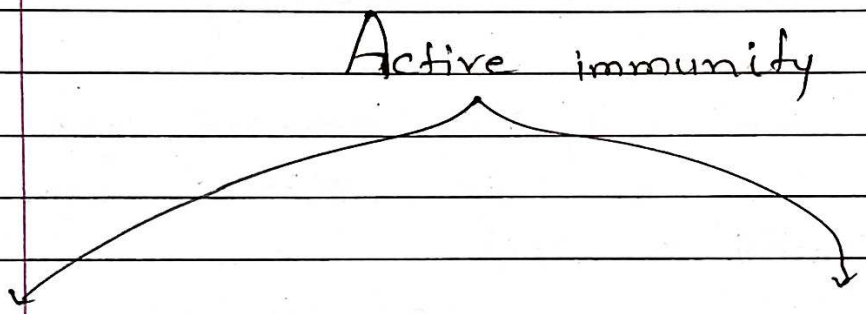
✱ Active / passive immunity

- Active immunity

→ Body actively form antibodies upon intraction with antigen

→ Takes time but long lasting

→ Memory cells are formed



(i) Natural active immunity

(ii) Artificial active immunity

(i) Natural active immunity

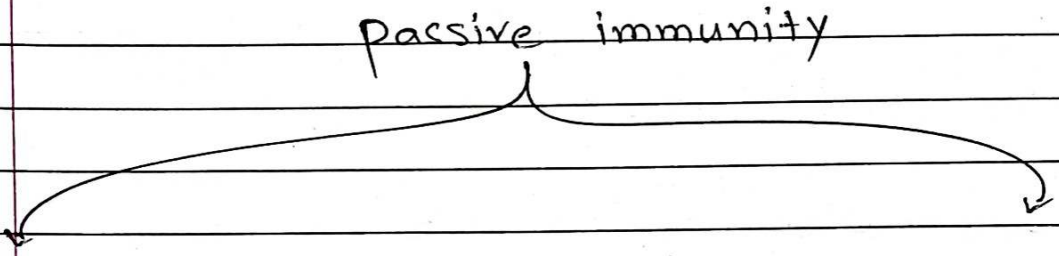
→ In case of any common diseases, pathogens enters and our immune system response and generates memory cells.

(ii) Artificial active immunity

→ Vaccination is case where weak pathogen are introduced into body so that they don't cause disease but activate the immune system to generate memory cells.

Date ___/___/___
Page ___

• Passive immunity
→ Antibodies are directly recieved
→ fast action but not long lasting
→ No memory cells formed



(i) Natural passive immunity

(ii) Artificial passive immunity

(i) Natural passive immunity
→ Ig like 'IgA' in colostrum, IgG via placenta are recieved from mother to the bady naturally

(ii) Arficial passive immunity
→ preformed/readymade antibodies are given for a quick response in case of ÷ snake bite (Antivenom), After cut/injury (ATS)

* Vaccination & Immunisation

→ Vaccination results in Immunisation (development of Immunity)

Date ___/___/___
Page ___

- Vaccination is a process in which whole organism (killed & weaked) or surface protein or toxins released or DNA is introduced in body

- purpose of vaccination is to generate memory cells

- Generation of vaccine

- 1st generation vaccine
  ↳ whole organism used (Heat killed or weaked) as vacine

- 2nd generation vaccine
  ↳ A part of organism or toxins used as vaccine

- 3rd generation vaccine
  ↳ DNA of organism used as vaccine

Date ___/___/___
Page _____

* Allergy

- Exaggarated (over) immune response of body towards allergens.
- Allergens ÷ pollen grain, dust, mites, a few food items & animal dander (hair) etc
- Upon exposure to allergens redness, swelling (inflammation), sneezing, watery eye, bronchioconstriction & blood pressure reduce (due to histamine) etc occur due to mast cell & basophils (WBC)
- Mast cells & basophils secrete ÷ Histamine, Heparin, serotonin
- Allergy involves IgE, it bind with mast cell & basophils
- prevention ÷ avoid exposure with allergen (wear mask)
- Drugs like Anti-histamine, Adrenaline, Steroids are given to reduce symptoms of allergies
- Ex ÷ Hay fever (against pollen grain), Bronchial asthma

Date ___/___/___
Page ___

Autoimmunity

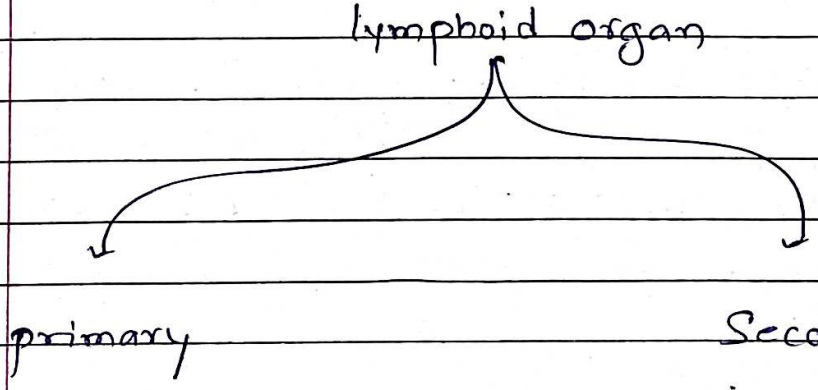
"Immunity against self is known as Auto-immunity"

- A condition in which immune system lost the ability to differentiate b/w self & non-self. Hence, start preparing antibodies against self antigen or self-tissue. This condition is known as Autoimmunity resulting in Auto immunity disorders.

e.g. Rheumatoid Arthrits, Myasthania Gravis, Hashimoto disease, Vitiligo

Lymphoid organs

→ Organ where origin, maturation and proliferation of lymphocytes occur



Date ___/___/___
Page _____

• Primary lymphoid organ

→ Origin and maturation of lymphocytes occur

→ includes :-

① Bone marrow
- ↳ origin of both B and T lymphocytes
- ↳ maturation of B-lymphocyte

② Thymus
- ↳ lobed organ present near heart, beneath sternum
- ↳ maturation of T-lymphocyte occur
- ↳ with age, size of thymus decreases

~~Extra :- MA~~

• Secondary lymphoid organ

→ provide site for interaction of lymphocytes with antigen.

→ include :- lymphoid node, tonsils, peyer's patches, spleen, Appendix, MALT (mucosa associated lymphoid ~~orga~~ Tissue)

Extra :- MALT constitute 50% of lymphoid tissue in human

Maturation → antigen sensitive

Date __/__/__
Page _____

* AIDS
  ↳ Acquired immuno deficiency Syndrome (group of symptoms)
  - Acquired: gained during lifetime
  - immuno deficiency: ↳ immune system ~~weak~~ weak.

- First reported case in 1981 (U.S)
- World AIDS day : 1 December

→ In last 25 years, more than 25 million people die because of AIDS.

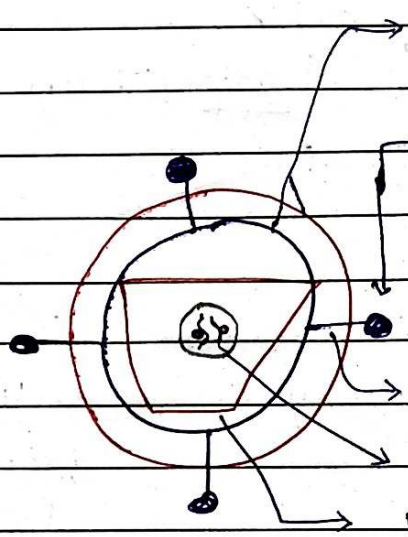
→ Causative agent ÷ HIV (Human immunodeficiency virus)

- Structure of HIV
  ↳ Retro virus (RNA as genetic material)

→ HIV is enveloped virus.

→ Two ss RNA, Reversetranscriptase (2), also has enzyme Intergase.

Date ___/___/___
Page ___



- Mode of ~~Transmition~~ Transmission

→ ~~Infect~~ from infected mother to the foetus
→ By sharing infected nedles (like in case drug abuse)
→ Infected blood transfusion
→ Unprotected sexual intercourse with infected person

- High risk for AIDS

→ Those with multiple sexual partner
→ Drugs abusers (intra vinous injection)
→ Those who require multiple transfusion
→ Children ~~born~~ born to HIV infected mother

Date ___/___/___
Page ___

- Lifecycle of HIV

attacks on ~~act~~

Macrophages
→ Act as HIV-factory

TH cell
→ Their no. reduces from 1200/mm3 of blood to 200/mm3 blood

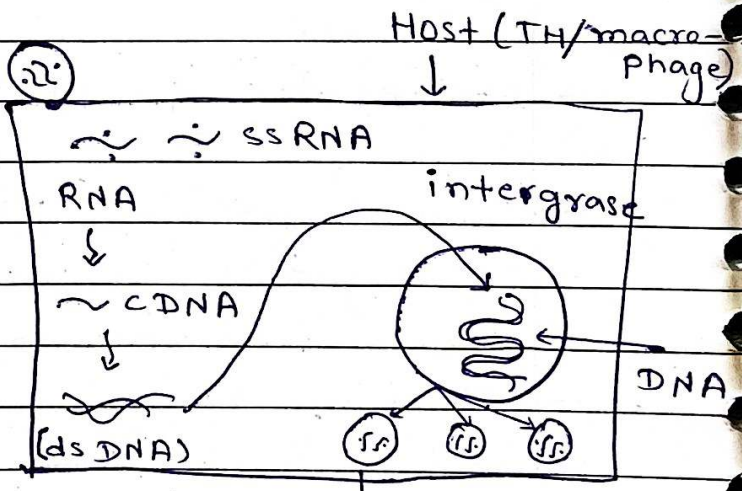
→ Central Dogma

DNA → replication
↓ Transcription
RNA
↓ Translation
protein

RNA
reverse Transcri
cDNA
↳ complement
-ary

- integrase enzyme attached virus DNA to host DNA

- Now the virus DNA is a part of host DNA, it uses our machinary to make viral RNA & neccessary protein



Date ___/___/___
Page ___

Note: Oppurtunistics infection like by many viruses, fungi, bacteria like mycobaterium (Tuberculosis) Toxoplasma (protozoa causing Toxoplasmosis) may be seen when person suffers from AIDS.

Symptoms: Fever, Weightloss, diarrohe is seen & 5-10yr is the time period for the symptoms to appear from time of infection

Diagnosis: ELISA: Enzyme Linked immuno Sorbant Assay (most commonly used diagonstic test)

- Confirmatory Test: Western blotting

- ~~Prev~~ prevention & control

→ Can only be prevented. No cure

- Treatment

↳ Druge like AZT: Azidothymidine (anti-retero-viral drugs)

↳ It can only ↑ life of patient for few years but can't be cure

- NACO (National AIDS control organization) & other NGOs are working to create awarness & prevention of AIDS

Date ___/___/___
Page ___

- WHO is creating safe blood banks, promoting use of disposable needles, free condom distribution, promoting regular health checks.

* Cancer (non-infectious)

→ One of the most dreaded (deadliest) diseasing causing many deaths.

- properties of cancerous cell

(1) Uncontrolled and Unregulated cell division of Cancerous cell form Tumor ~~is called Tumor~~

(2) No contact inhibition
(contact inhibition is a property of normal cell which divides & comes in contact with neighbouring cells & stop division which is absent in cancerous cell)

(3) Tumor cell take nutrition from normal cell (& normal cell become nutrition deprived)

(4) Doesn't show Apoptosis (natural cell death)
↳ Cancerous cell became immortal

Date ___/___/___
Page ___

- There are some 'regulatory genes' present in our cell, whose breakdown causes cancer

Regulatory gene

① proto oncogenes / cellular oncogenes / c-oncogene

② Tumor suppressor gene

→ Normal gene in our cell, controling cell growth but once activated (mutated) convert into cancer causing ONCOGENES (cancer)

② Tumor suppressor gene

→ Acts as check points for a cell gaining through cell division, if division is normal it is ~~not~~ complete division, if abnormal, it is not allowed to go further due to check point

→ If these genes mutated

↓

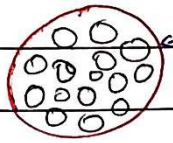
Cancer might happen

Date ___/___/___
Page ___

- Types of Tumor

(1) Benign Tumor

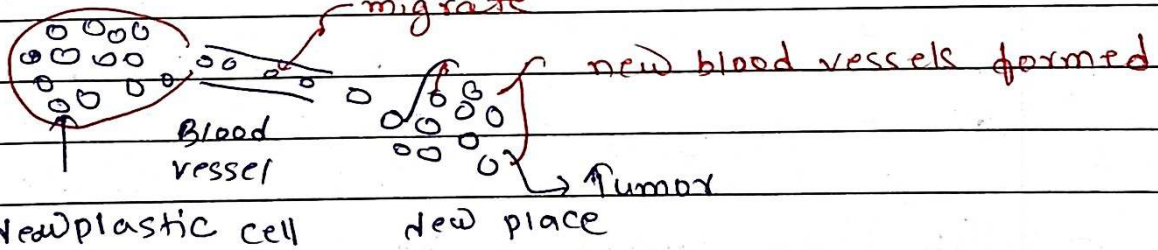
→ It is mass of cell present or localised at a place
→ It is encapsulated (covering around it)



→ No metastasis
→ Non-cancerous, less dangerous

(2) Malignant Tumor (cancerous, dangerous)

- It is the mass of cells that can potentially breakout of encapsulating & move to new places.



Malignant tumor (Neoplasm)

→ Metastasis seen
↳ The property of tumor cell by which it can move from one place to another

Date ___/___/___
Page _____

- Causes of Cancer (Carcinogens are cancer causing agents)

① physical agents

→ radiations like X rays, gamma rays (ionising radiation), UV-rays (non-ionising)

② Chemical agents

→ Tobacco smoking, chewing, soot, coaltar, mustard gas, Asbestos (pollutants) etc

③ Biological agents

→ Virus like HPV (human papilloma virus), HIV, HBV (Hepatitis-B virus) have viral oncogenes

→ can cause changes & mutation in our gene

- Diagonosis

① Biopsy & histopathological study

→ Biospy is make fine section of tissue suspected to be cancerous & then studied under microscope, known as Histopathology

Date ___/___/___
Page _____

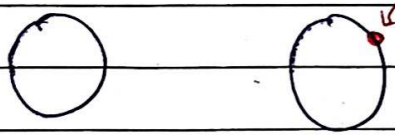
(2) Blood & Bone marrow
→ Usally performed in case of blood cancer (Leukemia). no. of WBC's ↑↑

(3) Radiography :- X rays used to obtain 2-D image of internal organ

(4) CT. scan (computed - Tomography)
→ X-rays used to obtain 3D image of internal organ

(5) MRI (Magnetic Resonance imaging)
→ Strong magnetic field used to obtain 3D image of internal organ (safest Technique)

(6) Antibody Test



dormal cell Cancer cell

Note:- If Cancer runs in family history, one can pre-diagnose for over-expression of gene.

e.g. Normally : 10000 genes activate

pre-diagnosis : 20000 genes activated

Date ___/___/___
Page ___

• Treatment of Cancer

① Surgery
↳ Surgical removal of tumor

② Radiotheraphy
↳ Radiation like gamma rays are used specifically to target tumor cells while trying to protect neighbouring cells

③ Chemotheraphy
↳ Drugs / medicine / chemicals are used to treat the patients, Side effects like hairloss, Anemia, weightloss seen.

④ Immunotheraphy
↳ α-interferons used, these are biological response modifiers, these activate NK cells to target the tumor cell cell

Note :- Combination of these treatment usally given to the patient

Date ___/___/___
Page ___

Drugs

- Drugs are usually the chemical/medicine used for clinical purpose but when misused/abused by people is called Drug abuse.

- Drug abuse is most commonly seen in people of Adolescence age group (12 - 18 yr)

- Addiction: Continous presence of certain chemical constantly required in the body & if a person is stopped from consuming them they show ~~this~~ Withdrawal syndrome

↙

group of symptoms like shakiness, sweating, Agressiveness, Nausea

Drugs

① Tranquillizers

② Opiods/opiate Narcotics

③ Stimulants

④ Hallucinogens

Date ___/___/___
Page _____

① Tranquilizers

e.g. Benzodiazepens, Barbiturates

→ It suppress CNS activity
→ It promotes sleep, bring calmness
→ As clinical significance can be used to treat Insomnia (sleeplessness), As

② Opiods

→ Receptors present on GI tract & CNS
→ They also suppress the CNS activity & slows body function.

e.g. Morphine, Heroin

- Morphine
  ↳ obtained ~~for~~ from latex of 'poppy plant' (Papaver sominiferum)

→ It is very commonly used as a Sedative & as painkiller (clinical significance) for a patient who has undergone surgery.

Date ___/___/___
Page ___

- Heroin
  ↳ It is diacetylated Morphine
  → Commonly called 'Smack'
  → It is usually snorted or taken intravenously
  → It is white, odorless, crystalline, bitter

Note :- Opiods can be Euphoric (cause Euphoria)
Temporary feeling of happiness

Stimulant

(a) Coca alkaloid (cocaine, crack, coke

→ Coca alkaloid obtained from Erythroxylem coca a native to South america

→ Usually snorted

→ This increase energy, alertness, activity etc

→ It interfers with the transport of the neurotransmitter Dopamine
↓
It level is maintain in the synaptic cleft for a longer time

→ Cause 'Euphoria'
→ Excessive dosage cause Hallucination

Date ___/___/___
Page ___

(b) Amphitamines

→ Synthesis in lab
↑ activity, ↑ alertness
→ Sleeplessness
→ Commonly abuse by Sportsperson

(c) Toccabo

→ Consumed by Human more than 400 year
→ Has chemical known as Nicotene
→ Can be taken orally (chewed), snuffed or smoking.

→ Its consumption causes oral cancer, Lung cancer Urinary bladder cancer, Gastric ulcers, Emphysema, CAD (Coronary artery disease) etc.

· Smoking may also elevate the secretions of Epinephrine & Norepinephrine from Adrenal medulla, this increase Heartrate & Cardiac output. It also increase CO level in body

CO has 200 – 250 time more affinity for Hb than O_2
↓
It binds to Hb
↓
Hence, 'HbO_2' : Oxyhaemoglobin level drop

Date ___/___/___
Page _____

* Hallucinogens (Psydelic drugs)
  ↳ Drugs that cause hallucination
    ↳ Distorted sense of reality

① Cannabinoids

→ Receptors mainly present in brain
→ Obtained from the inflorescence of plant Canabis sativa

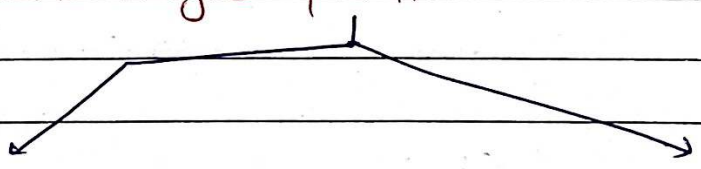
e.g. Marijuana, hashish, charas and ganja
  ↳ produced by various combinations of flower tops: Leaves, resins

→ Consumed orally or smoked

→ Cause hallucination, affects the Cardio-vascular activity of a person (↑ Heart rate)

→ These days commonly used by sports person

Note ÷ Other hallucinogic plants



Datura Atropa belledona

Date ___/___/___
Page ___

- Most potent hallucinogen : LSD (Lysergic acid Diethyl amide)

  Obtained from fungus (Claviceps purpura)

* Anabolic steroids

Synthetic drugs (testosterone derivative), commonly abused by sports person to increase muscle buit, stamina & performance.

- Side effect in female

→ Masculinisation (muscle development) (features like males), increased aggressiveness, mood swings, depression, abnormal MC, excessive hair growth on the face and body, enlargement of clitoris, deepening of voice.

- Side effects in ♂

→ Acne, increased aggressiveness, mood swings, Depression, reduction of size of testicles, decreased sperm production, potential for - kidney and liver dysfunctic, breast enlarge- ment, premature baldness, enlargement of prostate gland.

Note :- Along with Anabolic steroids, Narcotics (Morphine/Heroin), Diuretics (drugs that promotes Diuresis) also ∞ abused

Date ___/___/___
Page _____

* Alcohol abuse

- Alcohol is absurbed from GI tract (mainly stomach)
- Cerebellum is affected result in body balancing impaired
- Alcohol metabolism in Liver

↓

Excess Alcohol consumption

↓

fats starts accumulating in liver

↓

fatty liver

- may also cause severe liver damage = 'Liver Cirrhosis'
- Alcohol consumption by pregant ♀ cause ~~chan~~ abnormal development in foetus

Note: Excessive dosage of Drugs/alcohol may cause coma & even death due to heart failure or Cerebral haemorrhage (internal bleeding) or Respiratory failure

- prevention and control

→ Avoid undue peer pressure, Education and counselling, seeking help from parents and peers, looking for danger signs, seeking professional and medical help